

CLAIMS

What is claimed is:

5 1. A soy protein product having (a) at least 60% protein of total dry matter; (b) a combined monosaccharide and sucrose content of at least 10% of total dry matter; (c) a combined raffinose and stachyose content of less than 5% of total dry matter and (d) being substantially free of galactinol.

10 2. The product of claim 1 wherein the soy is not from low oligosaccharide soybeans.

15 3. The product of claim 2 wherein the product is an enzyme treated product.

4. The product of claim 3 wherein the enzyme is a α -glycosidase.

20 5. The product of claim 4 wherein the α -glycosidase is a α -galactosidase with essentially no invertase activity.

6. The product of claim 1 having less than 10% sucrose of total dry matter.

25 7. The product of claim 1 wherein the sucrose content is at least 10.5% of total dry matter and the monosaccharide content is about 2-3% of total dry matter.

8. The product of claim 1 wherein the product has less than 1.5% stachyose of total dry matter and less than 2-3% raffinose of total dry matter.

9. The product of claim 1 wherein the product has less than 2% crude fiber of total dry matter.

10. The product of claim 1 having an isoflavone content greater than 2500 micrograms/gram of total dry matter and a sulfur-containing amino acid content greater than 2.2% of total amino acid content.

30 11. A liquid or dry beverage, food or nutritional product that uses the product of claim 1.

12. A method for manufacturing a protein product comprising:

(a) providing a substantially defatted soybean material;

5 (b) treating said material with an enzyme at an effective temperature and pH for an effective time to achieve a combined monosaccharide and sucrose content of at least 10% of total dry matter in said product and a combined raffinose and stachyose content of less than 5% of total dry matter in said product;

10 (c) removing fiber from said material before or after said treatment to achieve at least 60% protein of total dry matter in said product;

(d) inactivating said enzyme after said treatment.

15 13. The method of claim 12 wherein the enzyme is a α -glycosidase enzyme.

14. The method of claim 13 wherein the α -glycosidase is a α -galactosidase with essentially no invertase activity.

20 15. The method of claim 14 wherein the treatment uses about 450-2300 galactosidase units per pound of the material.

16. The method of claim 12 further comprising slurring the material with water prior to the enzyme treatment or fiber removal.

25 17. The method of claim 16 wherein the slurry is about 10-20% solids.

18. The method of claim 12 wherein the effective temperature is about 125-140 degrees Fahrenheit.

30 19. The method claim 12 wherein the effective pH is about 6-6.5.

20. The method of claim 19 wherein the effective pH is achieved by adding hydrochloric acid to said slurry.

21. The method of claim 12 wherein the effective time is about 1-4 hours.

22. The method of claim 21 wherein the effective time is about 1-3 hours with the product having greater than 1.5% stachyose of total dry matter and less than about 2-3% raffinose of total dry matter.

23. The method of claim 21 wherein the effective time is about 2-4 hours with the sucrose being at least 10.5% of total dry matter in the product and the monosaccharide content being about 2-3% of total dry matter in the product.

24. The method of claim 16 wherein the fiber removal is performed by adjusting the pH of the slurry to about 7-7.5 and separating said pH adjusted slurry to form a cake containing a high amount of fiber.

25. The method of claim 24 wherein the pH is adjusted using sodium hydroxide.

26. The method of claim 24 wherein the separation is performed by centrifugation.

27. The method of claim 16 further comprising drying the enzyme treated, fiber removed slurry.

28. The method of claim 27 further comprising concentrating the fiber removed, enzyme treated slurry prior to the drying.

29. The method of claim 28 wherein the concentrating is performed by means of evaporation or membrane filtration.

30. The method of claim 29 wherein the drying is spray drying.

31. The method of claim 24 further comprising drying the cake to form a high fiber byproduct.

32. The method of claim 12 wherein the enzyme inactivation is pasteurization at about 180 degrees Fahrenheit.

33. The method of claim 12 wherein the material has a protein dispersibility index of 90.

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34. The method of claim 33 wherein the material has not been heat-treated.

35. The method of claim 12 wherein the material is substantially free of galactinol.

10 36. The method of claim 12 wherein the product has less than 2% crude fiber of total dry matter.

37. The method of claim 12 wherein the product has an isoflavone content greater than 2500 micrograms/gram of total dry matter and a sulfur-containing amino acid content greater than 2.2% of total amino acid content.

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38. A liquid or dry beverage, food or nutritional product that uses the product of claim 12.

39. A method for manufacturing an enzyme treated, soy protein product comprising:

(a) providing a soybean material having at least 50% protein (N X 6.25); about 30-40% carbohydrates; about 5-10% moisture; less than about 1% fat and a protein dispersibility index of about 90 and being substantially free of galactinol;

(b) slurrying said material with water, such that said slurry is about 10-20% solids; hydrochloric acid, such that the pH of said slurry is about 6-6.5, and an effective amount of a α -galactosidase enzyme;

(c) reacting said slurry for about 1-4 hours at about 125-140 degrees Fahrenheit;

(d) adjusting the pH of said reacted slurry to about 7-7.5 with sodium hydroxide;

(e) centrifuging said pH adjusted, reacted slurry to form a cake and a liquor;

(f) pasteurizing said liquor to inactive said enzyme;

(g) concentrating said pasteurized liquor by means of evaporation or membrane filtration;

(h) spray drying said concentrated liquor to form said product having at least 60% protein of total dry matter; a combined monosaccharide and sucrose content of at least 10% of total dry matter; a combined raffinose and stachyose content of less than 5% of total dry matter and less than 2% crude fiber of total dry matter.

40. The method of claim 39 further comprising drying the cake to form a high fiber byproduct.

41. A liquid or dry beverage, food or nutritional product that uses the product of claim 39.